

Research Evidence Report

Comprehension Strategies Instruction Incorporating Vocabulary and Fluency in the Middle Years of Schooling

Research Evidence that Supports the *Comprehension Strategies Instruction (CSI)* Resource



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Introduction – Evidence-based literacy instruction

In recent years, teaching and learning approaches and the materials used in classrooms have increasingly been benchmarked against research evidence.

Comprehension Strategies Instruction (CSI) is a classroom literacy program that is based on research evidence and is designed to impact on the literacy achievement of students and to provide strong support for teachers in grades 3 through 8, particularly in the areas of comprehension strategies instruction, vocabulary, and fluency.

The National Reading Panel promotes comprehension, fluency, and vocabulary as three of the five “pillars” of reading instruction.

Evidence strongly points to significant benefits to students when teachers provide specific instruction before, during, and after students read... The process helps students link new ideas to what they learned previously, remember what was read, and think critically.

(Sturtevant, 2003)

CSI is founded on two major research strands:

- The strand that evidences the need for comprehension instruction in the middle years grades, particularly instruction that includes content area literacy
- The strand that focuses on effective instruction, including research from New Zealand that suggests ways to give all students, whether mainstream students, struggling readers, or English Language Learners (ELLs), access to similar learning opportunities and outcomes

The following report outlines the substantial scientific and other research evidence that supports the instructional approaches included in the *CSI* resource.

* Specific references to the National Reading Panel reports are boxed throughout this report (National Institute of Child Health and Human Development, 2000).

CSI – The Research Evidence Synthesis

CSI Supports Teachers as They:

Engage

Display engaging, short, diverse texts in English language arts and the content areas of science, math, and social studies to learn comprehension strategies prior to, while interacting with, and when reflecting on texts.

Scaffold and Model

Use explicit instruction with all eyes on one grade-level digital text. The teacher reads aloud, thinks aloud, and interacts with students. Digital glossaries support comprehension. Audio models and peer interaction scaffold struggling readers and ELLs in cooperative groups.

Interact and Reflect

Have students interact with the text, the teacher, and their peers, as they apply metacognitive strategies, i.e., read, talk, and think their way through the text – **revisiting new concepts at least three times.**

Apply and Assess

Have students apply strategies through cooperative activities and assess their developing knowledge by using a reflection journal and assessment rubric. Teachers use the assessment rubric formatively and summatively.

CSI Assessment Rubric

Formative

Teachers' assessment, student self-

Engage

Biancarosa and Snow, *Reading next*, 2006
 Guthrie, "Contexts for engagement and motivation in reading," 2001
 Guthrie, *Classroom practices promoting engagement and achievement in comprehension*, 2004
 Harvey and Goudvis, *Strategies that work*, 2000, 2007
 International Reading Association, *Standards for middle and high school literacy coaches*, 2006
 Robb, *Teaching reading in social studies, science, and math*, 2003

Scaffold and Model

Clark and Graves, "Scaffolding students' comprehension of text," 2005
 Durkin, *Teaching them to read*, 1993
 Grady, *Adolescent literacy and content area reading*, 2002
 Harvey and Goudvis, *Strategies that work*, 2000, 2007
 Johnston and Allington, "Remediation," 1991
 Nuthall, *The hidden lives of learners*, 2007
 Rasinski, *The fluent reader: Oral reading strategies for building word recognition, fluency, and comprehension*, 2003
 Report of the National Reading Panel, National Institute of Child Health and Human Development, 2000
 Smolkin and Donovan, "Oh excellent, excellent question!" 2002
 Strickland, Ganske, and Monroe, *Supporting struggling readers and writers: Strategies for classroom intervention 3–6*, 2002
 Sturtevant, *The literacy coach*, 2003
 Valencia and Riddle Buly, "Behind test scores: What struggling readers really need," 2004
 Vygotsky, *Mind in society: The development of higher psychological processes*, 1978

Interact and Reflect

Au, "Multicultural factors and the effective instruction of students of diverse backgrounds," 2002
 Harvey and Goudvis, *Strategies that work*, 2000, 2007
 Keene, *Assessing comprehension thinking strategies*, 2006
 Nuthall, *The hidden lives of learners*, 2007
 Nuthall and Alton-Lee, "Predicting learning from student experience of teaching," 1993
 Nuthall and Alton-Lee, *Understanding learning in the classroom*, 1997
 Smolkin and Donovan, "Oh excellent, excellent question!" 2002
 Trabasso and Bouchard, "Teaching readers how to comprehend text strategically," 2002
 Williams, "Classroom conversations: Opportunities to learn for ESL students in mainstream classrooms," 2001

Apply and Assess

Afflerbach, "Teaching reading self-assessment strategies," 2002
 Assessment Reform Group, *Assessment for learning: Beyond the black box*, 1999
 Black and Wiliam, *Inside the black box: Raising standards through classroom assessment*, 1998
 Block and Pressley, *Comprehension instruction: Research-based best practices*, 2002
 Institute for the Advancement of Research in Education, "Graphic organizers: A review of scientifically based research," July 2003.
 Keene, *Assessing comprehension thinking strategies*, 2006
 Pressley, "Metacognition and self-regulated comprehension," 2002

The case for explicit comprehension strategy instruction for middle years students

The problem – an urgent need for comprehension instruction

Research reports since 2000 have confirmed both the need for comprehension instruction in the middle years and at high school, and its urgency.

The most recent National Assessment of Educational Progress (NAEP, 2002) shows that many eighth-grade and twelfth-grade students do not have the capacity to perform the higher order cognitive work required for deep learning of content through reading. (Kamil, 2003, p. 12)

Michael Kamil of Stanford University urges educators to respond immediately:

This is an extremely complex problem, and the longer we let these kids go the more serious the problem becomes.... The problem exists because [after 3rd grade] we stop providing reading instruction, and the instruction we do provide is not what they need.

(Kamil, as cited in Manzo, 2005, p. 38)

The RAND Reading Study Group Report of 2002 commented that national longitudinal data shows that three-quarters of students who exit third grade as struggling readers continue to read poorly in high school (Peterson, Caverly, Nicholson, O'Neal, and Cusenbary, 2001; Snow, 2002).

In a comprehensive 2004 report for the Carnegie Corporation, Harvard University's Catherine Snow and Gina Biancarosa implored: ... *in short, they [middle years students] must be taught how to comprehend.* (2004, p.1) Furthermore, ... *children who are reading up to grade level in the primary grades do not automatically become proficient readers in later grades.*

(Biancarosa and Snow, cited in International Reading Association, 2006, p. 1)

The National Reading panel clearly outlined the importance of explicit comprehension teaching: ... *comprehension instruction can effectively motivate and teach readers to learn and to use comprehension strategies that benefit the reader*

(Report of the National Reading Panel, 2000).

Comprehension is critically important to the development of children's reading skills... Indeed, reading comprehension has come to be the 'essence of reading' (Durkin, 1993)...

(Report of the National Reading Panel, 2000)

Riddle Buly and Valencia profiled students who failed state reading assessments. They concluded that:

... poor performance on the test was likely not due to a fundamental lack of decoding or word identification ability.... These students could decode at a higher level than they could comprehend.... Many students struggled more with meaning than they did with word identification.

(2002, p. 226)

Research support for comprehension strategies instruction

There is clear scientific and other evidence for comprehension strategies instruction:

The bottom line is that readers who are given cognitive strategy instruction make significant gains on comprehension compared with students who are trained with conventional instruction procedures.

(Trabasso and Bouchard, 2002, p. 177, citing Pressley, Johnson, Symons, McGoldrick, and Kurita, 1989; Rosenshine and Meister, 1994; and Rosenshine, Meister, and Chapman, 1996)

The researchers defined comprehension strategies as follows:

Comprehension strategies are specific learned procedures that foster active, competent, self-regulated, and intentional reading.

(Trabasso and Bouchard, 2002, p. 177)

The National Reading Panel summarized the scientific research and concluded:

... explicit or formal instruction in the application of comprehension strategies has been shown to be highly effective....

(Report of the National Reading Panel, 2000)

Giving priority to helping struggling readers and English Language Learners with comprehension, vocabulary, and fluency

It is vitally important that all students, including those struggling to acquire decoding skills and those who are English Language Learners, receive instruction in comprehension strategies and in fluency and vocabulary acquisition.

Ivey comments “teachers ... may wrongly assume that struggling readers who have limited ability to read the words are incapable of thinking about text in complex ways.” (2002, p. 235)

(See point 7 on page 17 for more discussion of the research related to struggling readers and ELLs.)

Comprehension strategies for struggling readers

For struggling readers, a key approach was to guide students in:

... self-regulating the selection and use of strategies for comprehending text.

(Reutzel, Camperell, and Smith, 2002, p. 337)

Using audio texts to develop fluency

In a review of research on the effectiveness of repeated reading, the Center for the Improvement of Early Reading Achievement found that audio-supported repeated reading “enabled children to read more difficult material than they might otherwise be able to read” (Kuhn and Stahl, 2000, p. 24). The study examined both unassisted and assisted forms of repeated reading practice. It found clear differences in favor of assisted reading (that is, where the child had an explicit model to assist with the rendering of the text. “Assisted reading... had clear effects on children’s oral reading and comprehension.” (Stahl and Kuhn, 2002.)

The National Reading Panel found that repeated reading with audio support leads “to marked improvements in student reading performance.”

(Blum et al., 1995, cited in National Reading Panel, 2000)

Audio texts supply students with good models of fluent reading. Chomsky (1978) and Samuels (1979) reported, “Modeled reading may be especially beneficial for struggling readers” (Chomsky, 1978, and Samuels, 1979, cited in Worthy and Broaddus, 2001–02, p. 338). According to Allington (1983, cited in Kuhn, 2003), the lack of models of fluent reading is one of the greatest disadvantages facing struggling readers.

Regarding ELL students, Roser, 2001, supported the provision of fluent models of English to ELL students, contending that it helped students to “learn to read in their second language of English.” (Roser, 2001, in Johns and Bergland, 2002, p. 35)

The need for *multiple* comprehension strategy instruction

While it is recommended that the strategies be introduced to students independently of one another, it is understood that readers rarely use them this way (Harvey and Goudvis, 2000, p. 12). How would a reader visualize without making a connection? How would one synthesize without first determining what were the most important ideas?

Reviewing 17 multiple-strategy instruction studies (other than reciprocal teaching), Trabasso and Bouchard reported:

These multiple-strategy studies showed this procedure is very powerful in teaching comprehension skills.
(Trabasso and Bouchard, 2002, p. 184)

The importance of content-area literacy

There is significant research support for the inclusion of content-area literacy instruction:

Overall, content educators in a wide variety of disciplines and secondary literacy educators recommend that teachers develop the types of learning environments in which students are expected to use reading, writing, and discussion to solve problems, conduct research, experiment, and learn in a particular content area.
(Alvermann, Boyd, Brozo, Hinchman, Moore, and Sturtevant, 2002)

... students of all ages, from elementary to high school, have difficulty comprehending the structure of informational text
(McGee, 1982; Meyer, Brandt, and Bluth, 1980; Taylor, 1980, in Block, Gambrell, and Pressley, 2002, p. 9)

“... thematic materials provide repeated exposure to challenging vocabulary, sophisticated concepts, and important details related to the topic under study ... [and] provide students with opportunities to examine critically and interpret various types of content material.”
(Worthy and Broaddus, 2001–02, pp. 341–342)

Academic vocabulary

Students can find academic vocabularies especially challenging. Academic vocabularies comprise words with specific meanings that, while crucial to content area understanding, differ from the general meaning sometimes of the same word (Marzano, 2004, cited in Blachowicz, Fisher, Ogle, and Watts-Taffe, 2006). Students who master phonics, but don’t comprehend well, are missing vocabulary knowledge (Biemiller, 2000); this can be a crucial factor underlying the school failure of many students (Graves, 2007).

Integrated and comprehensive vocabulary instruction is therefore essential. The most effective approaches to instruction “are ones that are integrated with the curriculum and include attention to word learning throughout the day and across subject areas. These approaches need to...reflect an understanding of how words work and how to make this apparent to children.” (Blachowicz et al., 2006, p.534.)

From a review of research Blachowicz et al. (2006), determined that good vocabulary instruction:

- takes place in a language- and word-rich environment
- includes intentional teaching of selected words
- includes teaching generative elements of words and word-learning strategies.

Marzano (2006) recently evaluated the ASCD's Building Academic Vocabulary programme, based on a process to teach standards-based academic terminology to students in grades 1–9. He found that "students who participated in the [Building Academic Vocabulary] programme exhibited greater ability to read and understand grade-appropriate materials in mathematics, science, and general literacy than their counterparts who did not participate in the program..."

The research evidence for the seven comprehension strategies chosen for *CSI*

1. Making Connections

When we apply our background knowledge as we read, we guide students to make connections between their experiences, their knowledge about the world, and the text they read. Connecting what readers know to new information is the core of learning and understanding.

(Harvey and Goudvis, 2007, p. 17)

Good readers make many connections between the text they are reading and their own experiences to make more meaning as they read. As teachers, we need to be aware that:

Effective teachers helped readers make connections between texts they read and their personal lives and experiences.

(Sweet and Snow, 2002, p. 44)

Regarding the role of prior knowledge, Reutzel, Camperell, and Smith summarize the research as follows:

Good readers tend to make knowledge-based inferences that are directly related to what they are reading. In contrast, poor comprehenders frequently draw on unrelated prior knowledge leading to unwarranted and unnecessary inferences and comprehension failures.

(2002, p. 325)

... students of all ages, from elementary to high school, have difficulty comprehending the structure of informational text.

(McGee, 1982; Meyer, Brandt, and Bluth, 1980; Taylor, 1980, in Block, Gambrell, and Pressley, 2002, p. 9)

Researchers have identified three kinds of connections that proficient readers make as they read:

Text-to-self – connections the reader makes to their own experience and knowledge.

Text-to-text – connections that the reader makes from new texts to other texts that they have already experienced.

Text-to-world – connections to what the reader already knows of the world, their community, and what has happened to others. (Harvey and Goudvis, 2000, p. 21)

Proficient readers make connections from what they read to what they already know about the topic – struggling readers have difficulty with this. However, struggling readers may have rich background knowledge but may not be aware of how to relate it to the text. We, as teachers, need to show all students how to use the richness of their individual lives to better understand the texts they read.

2. Asking Questions

Questions are at the heart of teaching and learning.... Questions open the doors to understanding.... Proficient readers ask questions before, during, and after reading. They question the content, the author, the events, the issues, and the ideas in the text.

(Harvey and Goudvis, 2007, p. 18)

Questioning is the strategy that keeps readers engaged.

(Harvey and Goudvis, 2000, p. 11)

Good readers ask questions constantly – prior to reading, while interacting with the text, and when reflecting on what they've read. Questions promote engagement, invite prediction, create reasons to read, and foster comprehension.

Students exposed to questioning techniques that deepen their reading experiences are more able to generate "high quality talk" (Duke and Pearson, 2002) and to use these questions in their independent reading.

(Brown, 2004)

Students need to know that there are categories of questions:

- questions that are answered in the text
- questions that are answered from someone's background knowledge
- questions whose answers can be inferred from the text
- questions that can be answered by further discussion
- questions that require further research
- questions that signal confusion.

(Harvey and Goudvis, 2007, p. 113)

Critical literacy

While inferential questions are often described as "going beneath the surface of the text", critical questions can be described as "looking behind the text" to identify the writer's purpose for writing the text. As teachers, we should support students "in questioning the voices behind texts, whom texts represent and whom they do not, and what positions texts are assuming." (Stevens and Bean, 2002, p. 310, with reference to Freebody and Luke, 1999)

Stevens and Bean argue that:

Aspects of critical literacy must become part and parcel of the definition of comprehension.

(2002, p. 308)

Freebody and Luke pioneered research in the area of critical literacy, where they identified four roles that readers assume when reading: code breaker, meaning maker, text user, and text critic. This fourth role, argue Stevens and Bean, means that we must [help] "students to assume critical stances toward texts... supporting them in questioning the voices behind texts, whom texts represent and whom they do not, and what positions texts are assuming. (Stevens and Bean, 2002, p. 310)

In other words, while drawing inferences is often described as "going beneath the surface of the text" to look for meaning, critical literacy can be described as "looking behind the text" to identify the writer's agenda, so recognizing that all texts are written with a purpose and discerning what that purpose might be.

3. Visualizing

When readers visualize, they are actually constructing meaning by creating mental images. ... when we create scenarios and pictures in our minds while reading, our level of engagement increases and our attention doesn't flag.

(Harvey and Goudvis, 2007, p. 18)

The strategy of visualizing refers to the mind's capacity to imagine what is being suggested by words or symbols on the page or screen or by text that is heard. As proficient readers follow along with, or hear, a text, they can "see" what is happening, almost as if they are running a movie in their mind, and they utilize all their senses to create mental images of what they are reading or hearing. This is what we should model and teach to our students.

The most well established effect of visualization is that readers remember more of what they read.

(National Reading Panel, 2000)

Teaching children to construct their own mental images when reading nonfiction helps them stop, think about, and understand the information.

(Harvey and Goudvis, 2007, p. 19)

The strategy of visualizing is useful for many types of text. Think about how illustrations, maps, and diagrams support our comprehension of nonfiction texts or scientific journals. Teaching students how to create their own mental images when reading text or graphic representations will enhance their understanding. Using interactive whiteboards can help with this process, especially with struggling readers. "The interactive whiteboard acts as a multi-modal portal, giving teachers the potential to use still images, moving images and sound, and when used in this way, it can address the needs of learners who find text difficult as the only mode of communication." (Somekh, Haldane, Jones, Lewin, Steadman, Scrimshaw, Sing, Bird, Cummings, Downing, Harber Stuart, Jarvis, Mavers, and Woodrow, 2007, p. 6.) Interactive whiteboards can also be "particularly useful in supporting visualisation to assist in teaching difficult concepts or demonstrating skills." (Somekh et al., 2007, p. 7.)

Students should be encouraged to use all the senses of sight ("in the mind's eye"), smell, hearing, touch, and taste when visualizing to enrich the visuals and their subsequent recall and comprehension of the text.

4. Drawing Inferences

Readers infer when they take what they already know, their background knowledge, and merge it with clues in the text to draw a conclusion, surface a theme, predict an outcome, arrive at a big idea ...

(Harvey and Goudvis, 2007, p. 18)

A good explanation for the strategy of drawing inferences may be to think of the well-known concepts "reading between the lines" or "getting below the surface" of a text, where there is meaning to be found that is not directly stated by the author. However, Zimmerman and Hutchins offer two intriguing alternatives:

- *meaning is created in the mind of the reader* (2003, p. 12)
- *meaning is found between their ears* (2003, p. 97).

They make the vital point that, as readers, we infer different meaning from text, depending on our background knowledge, our point of view, and our ability to use strategies as we read.

Inferences are often more open-ended than predictions and may remain unresolved at the end of the reading. Harvey and Goudvis maintain that “if readers don’t infer, they will not grasp the deeper essence of the texts they read.” (Harvey & Goudvis, 2007, p. 18)

The teacher can open up or close down inferencing. Through the use of high-level and open questions, the teacher can open the way for students to make inferences. However, teachers can also close down inferencing by asking closed or factual questions.

Poetry and other fiction texts present obvious opportunities for inferencing, but there are also rich opportunities in nonfiction, where much can be determined about the intention of the author from, for example, the way a graph or table is constructed or a set of “facts” is presented.

Good readers tend to make knowledge-based inferences that are directly related to what they are reading. In contrast, poor comprehenders frequently draw on unrelated prior knowledge leading to unwarranted and unnecessary inferences and comprehension failures.

(Reutzel, Camperell, and Smith, 2002, p. 325)

CSI – Looking for clues in the text

One of the engaging elements of CSI is that the program encourages young readers to see themselves as “detectives”; that is, investigators who make predictions based on the clues they are picking up in the text as an important component of the strategy of drawing inferences. Good readers may make predictions before reading, basing them, perhaps, on the title or the picture on the cover of a book or the diagram accompanying a scientific text. Predictions often change during reading as the reader picks up more information that may confirm or conflict with the original prediction. After reading, predictions can be revisited and proven to be correct or incorrect.

5. Determining Important Ideas

Thoughtful readers grasp essential ideas and important information when reading. Readers must differentiate between less important ideas and key ideas that are central to the meaning.

(Harvey and Goudvis, 2000, p. 11)

Determining important ideas is sometimes referred to as finding the main ideas and supporting details in text, and, as such, it is an important part of reading competence. It is closely related to the skill of summarizing.

Learning how to determine what is important is particularly useful when reading nonfiction texts: *When we read nonfiction ... we need to focus on important information and merge it with what we already know to expand our understanding of the topic.*

(Harvey and Goudvis, 2007, p. 19)

Nonfiction texts typically present the reader with additional challenges about what’s important in a text by employing, for example, italics for certain terms, bold case for key words, subheadings, and bullet points. Meaning is often supported in nonfiction texts by the inclusion of diagrams, maps, tables and graphs, illustrations and charts, or photographs with captions. In addition, nonfiction often has special features that help the reader to determine importance, such as an index, a table of contents, a glossary, an appendix, and a list of references. Digital texts may have hyperlinks.

Determining the important ideas when reading fiction or other narrative texts often involves determining the overall theme, message, or moral in the text or the personality traits of the main character. In poetry, the reader may have to navigate figurative language and meaning that seems deeply buried, to extract the important information.

Annotating the text

"Annotating helps readers reach a deeper level of engagement and promotes active reading."

(Porter-O'Donnell, 2004, p.82)

Teachers should demonstrate that determining what's important in a text often involves marking (or annotating) the text with a pencil or sticky note to indicate the main ideas.

Annotating helps students create a "dialogue with the text" (Probst, 1988, cited in Porter-O'Donnell, 2004) by recording their thoughts as they emerge while making sense of the text. From her classroom-based research, Porter-O'Donnell (2004) found "...annotating had helped students see that reading is a process and that applying the ways of responding to text through annotation changes comprehension. Because annotating slows the reading down, students discover and uncover ideas that would not have emerged otherwise. Many students discovered that this helps them become more active readers." (p. 85.)

Importance can be relative – The constructivist view

Teachers should be aware that, depending on the prior knowledge of the reader, there may be differing views about what is important in a text.

6. Synthesizing Information

Synthesizing happens when we merge the information with our thinking and shape it into our own thought. As readers distill text information into a few important ideas or larger concepts, they might form a particular opinion or a fresh perspective that leads to a new insight.

(Harvey and Goudvis, 2007, p. 19)

Synthesizing is the process of deriving insight from reading – of thinking your way through a text. The strategy of synthesizing information operates at several levels. At the simplest level, synthesizing is about taking stock of what we are reading, even stopping occasionally to "digest" the meaning and collect our thoughts before moving on. It is vital that students know about, and are instructed in, summarizing as a way of preparing themselves for the higher level strategy of synthesizing.

Summarizing is one of eight procedures that scientific research has proven to be effective in improving reading comprehension.

(National Reading Panel, 2000)

Determining important information or main ideas is part of summarizing and synthesizing at this level.

Synthesizing information is about more than summarizing, however. At the most complex level, "synthesizing information involves combining new information with existing knowledge to form an original idea." (Harvey and Goudvis, 2000, p. 25) As readers pause every now and then to take stock of meaning, they combine new information with what they already know to create new and original ideas or see a new perspective. Being able to synthesize information means that their thinking can evolve and change as the reader moves through the text.

Synthesizing enables the reader to integrate their thinking with the content of the text to get a "personal take" on what they read. To be able to synthesize information, readers need to be able to develop an awareness of how their own thinking evolves and changes. Annotating the text or marking it with sticky notes could be taught as part of synthesizing.

When readers synthesize, they

- Stop and collect their thoughts before reading on
- Sift important ideas from less important details
- Summarize the information by briefly identifying the main points
- Combine these main points into a larger concept or bigger idea
- Make generalizations about the information as they read
- Make judgments about the information they read
- Personalize their reading by integrating new information with existing knowledge to form a new idea, opinion, or perspective.

(Harvey and Goudvis, 2000, p. 25)

7. Monitoring Comprehension and Repairing Understanding

Monitoring comprehension and repairing understanding go to the heart of comprehension learning and teaching. These are the metacognitive strategies. As summarized below, students who are aware of their use of reading strategies comprehend more, and teachers who include monitoring and repairing understanding in their instruction do a great service to their students.

If confusion disrupts meaning, readers need to stop and clarify their understanding. Readers may use a variety of strategies to “fix up” comprehension when meaning goes awry.

(Harvey and Goudvis, 2000, p. 12)

Zimmerman and Hutchins (2003, p. 163) set out a good list of these strategies, including stopping to think, rereading, reading ahead, raising new questions, drawing inferences, trying to get a mental image, and connecting the reading to background knowledge.

Proficient readers monitor themselves as they read, checking for accuracy and checking that the text makes sense to them. It helps students to know that even adult readers have attention lapses or struggle with meaning when reading and find it necessary to use “fix up” strategies.

Researchers Trabasso and Bouchard (2002, p. 179) point to evidence that:

Training in comprehension monitoring... can be taught through teacher modeling and practice by children during reading.

(In Block and Pressley, 2002, p. 179)

Harvey and Goudvis (2007, p. 27) recommend that students need explicit instruction to

- Become aware of their thinking as they read
- Detect obstacles and confusions that derail understanding
- Understand how strategies can help them repair meaning when it breaks down.

CSI and monitoring comprehension and repairing understanding

CSI texts have been chosen to present a variety of text types and challenges to students and to present teachers with good models for instruction. The texts include unfamiliar content, difficult and unfamiliar vocabulary, technical terms, graphic features (such as maps, diagrams, charts, graphs, tables, and photographs), and text features that add meaning or complexity (such as subheadings and captions).

Effective instruction

The evidence-based instructional principles behind CSI

CSI is based on seven evidence-based principles of effective literacy instruction for middle years students. In summary, these principles are:

1. Use short, engaging, diverse texts for comprehension instruction, including content area texts.
2. Use metacognitive approaches before reading, while interacting with the text during reading, and while reflecting on the text after reading.
3. Involve students in interactive learning communities using cooperative-group or pair activities, including technology where possible.
4. Gradually release responsibility to the students throughout the learning process.
5. Include student self-assessment and peer-assessment and teacher formative and summative assessment.
6. Instruct students so as to give them several opportunities (at least three to four) to learn new concepts within a short period of time. This will enable all students in diverse classrooms to make similar progress.

(Nuthall, as cited in Alton-Lee, 2005, p. 7)

7. Assume that all students, including struggling readers and English Language Learners, can learn comprehension strategies.

Expanding the seven evidence-based principles of effective literacy instruction for middle years students

1. Use short, engaging, diverse texts for comprehension instruction

Short texts

CSI uses short pieces of text, displayed on acetate on an overhead projector or projected from a CD-ROM through a data projector onto an interactive whiteboard or any suitable screen or surface.

... we have found short text very effective for teaching comprehension.

(Harvey and Goudvis, 2007, p. 62)

Engaging texts

CSI texts are highly authentic and engaging. Guthrie, a leading researcher on student engagement, is adamant that engagement is vital:

Reading engagement is more highly associated with NAEP reading achievement than demographic variables that represent traditional barriers to achievement.

(Guthrie, 2004, slide 16)

Guthrie also says this when discussing the importance of engagement:

Engaged reading is a merger of motivation and thoughtfulness. Engaged readers seek to understand; they enjoy learning and they believe in their reading abilities.

(Guthrie, 2001, p. 1)

Diverse content area texts

CSI texts are specially chosen to reflect the texts that middle years students will encounter as part of their education. The texts are balanced for ethnicity, gender, and ability/disability and are balanced to teach equally from four major content areas – English language arts, math, science, and social studies.

In 2002, the Education Resource Information Centre (ERIC) identified adolescent literacy and content area reading as major issues.

2. Use metacognitive approaches before reading, while interacting with the text during reading, and while reflecting on the text after reading

In *Strategies That Work* (2000, p. 17), Harvey and Goudvis describe one of their goals as:

To move readers ... from the tacit level of understanding to a greater awareness of how to think while reading.

In CSI, this awareness by students of “how to think while reading” is made easier through the explicit teaching of the nuts and bolts of how metacognition techniques work.

CSI provides teachers and students with many exposures to the concept of metacognition:

- Helping students to monitor their understanding while reading
- Helping students to learn “fix-up” strategies when meaning breaks down (including the use of comprehension strategies to enhance understanding), for example, paying attention to the purpose for reading and noticing text structure and features
- Think-aloud
- Reinforcement writing activities
- Graphic organizers
- The CSI assessment rubric for self-assessment and peer-assessment

3. Involve students in interactive learning communities using cooperative-group or pair activities, including technology where possible.

At any grade level there are important benefits to having the students interact, through reading, thinking and talking with the teacher and with each other. (Vygotsky, 1978; Dowhower, 1999).

In the middle years, it is vital:

Active participation in learning is ... extremely important.

(Robb, 2003, p. 12)

Cooperative-group or pair activities

Laura Robb (2003) commented “... paired, small- and whole-group discussions are [also] effective ways for students to learn.”

(Alvermann et al., 1998, and Gambrell, 1996, in Robb, 2003, p. 12)

Although research has clearly indicated that peer discussion has a positive influence on higher level comprehension and engagement with text, and teachers recognize its value, research by Commeyras and DeGroff (1998) found that teachers rarely use peer discussion in classrooms.

Peer discussion provides an instructional context where comprehension is enhanced through student involvement and active cognitive engagement. (Almasi, 2002, p. 231)

Research has shown that peer discussion provides opportunities for children to grow cognitively, socially, and affectively. When students engage in peer discussion, the quality of their discourse, their ability to recognize and resolve comprehension dilemmas, and the cognitive processes associated with higher level thinking (for example, comprehension monitoring and metacognition) are enhanced (Almasi, 2002, p. 232).

... when teachers tend to ask literal questions, their students tend to focus on literal reading and recall of texts, rather than critical, higher-level, or interpretive readings.

(Almasi, 2002, p. 230)

In their evaluation of the use of interactive whiteboards in primary schools, Somekh et al. (2007) found that the whiteboards could be used to “facilitate a co-learner style of teaching, where teacher and pupils (‘we’) work together rather than adopting more formal roles as teacher and learner. The interactive whiteboard as a mediating artefact facilitates this style of teaching very powerfully.” (p. 111.) The researchers found that classrooms using interactive whiteboards were generally more co-operative and ‘sharing’ and generated a ‘community of learning’.

4. Gradually release responsibility to the students throughout the learning process

Upper-elementary and middle-school teachers need to balance the instructional attention they give to comprehension learning as they begin to help children read in an increasingly wide variety of genres and as they help their students manage the staggering amount of content presented in textbooks.

(Keene, 2002, p. 103).

CSI uses a variation of the Gradual Release of Responsibility model developed by David Pearson (1985). The model was built on the assumption that when a new concept is to be learned, high levels of teacher modeling and explicit instruction gradually give way to students using the strategy independently.

5. Include student self-assessment and peer-assessment and teacher formative and summative assessment.

Effective teachers ... monitored progress in reading through the use of informal assessments.

(Block, Gambrell, and Pressley, 2002, p. 44)

In the foreword to *Assessing Comprehension Thinking Strategies*, Ellin Keene says, “... teachers not only have to teach comprehension strategies but also to discuss how the strategy works to deepen comprehension.” Keene’s goal is to enable students to say, “I made a text-to-text connection, *and* here’s how it helped me better understand ...”. (2006, p. 6)

Formative assessment

As well as using the rubric for assessing students’ improvement in their use of comprehension strategies and in text comprehension, CSI is intended to be a highly formative resource.

Black and Wiliam have pioneered the use of formative assessment (which we at CSI would prefer to call “formative teaching”). Black and Wiliam describe formative assessment as improving learning through assessment using five “deceptively simple” factors:

1. *Providing effective feedback to students*
2. *Actively involving students in their own learning*
3. *Adjusting teaching to take account of assessments*

4. *Recognizing the profound influence assessment has on the motivation and self-esteem of students, both of which are crucial influences on learning*
 5. *[Recognizing] the need for students to be able to assess themselves and understand how to improve.*
- (1998, p.4)

Formative assessment can be further broken down to include:

- Sharing learning goals and intentions with the students
- Involving the students in self-assessment
- Providing feedback that leads the students to recognize their next steps and how to take them
- Having confidence that every student can improve.

CSI provides an assessment rubric for use by both students and teachers to help assess students' progress toward understanding and using the comprehension strategies.

Peter Afflerbach, in his article "Teaching Reading Self-Assessment Strategies", has this to say: *These assessment abilities help place students in a position to critically evaluate their knowledge and progress in relation to the text.*

(2002, p.98)

Summative assessment

Teachers can also use the CSI assessment rubric for summative assessment at the end of CSI. A number of assessment rubrics and activities for summative assessment are provided by Ellin Keene in her book *Assessing Comprehension Thinking Strategies* (2006). Our goal is to provide teachers with a rich, inclusive resource to use for assessment at all stages of teaching with the CSI program.

6. Instruct students so as to give them several opportunities to learn new concepts within a short period of time.

As a result of painstaking research in New Zealand involving a uniquely detailed process of classroom observations using video and audio recordings, Graham Nuthall and Adrienne Alton-Lee have come up with two vitally important findings:

1. If the appropriate number of learning experiences occurs, without significant gaps between them, learning occurs regardless of the ability level of the students.
2. What they [the students] learn is not dependent upon their ability but upon the ways in which they engage with classroom tasks and activities.

(1997, p.8)

Nuthall stated that to learn a new concept, students needed three to four relevant experiences in a short period of time so that emerging new learning isn't lost from the short-term memory. (Nuthall, and Alton-Lee, 1993)

CSI therefore offers multiple opportunities to learn each comprehension strategy within each lesson and the reinforcing activities that follow the lesson. As well as the many opportunities during lessons (for example, during think, pair, share) there are cooperative student activities, writing activities, graphic organizers, and journaling to reinforce the learning from the whole-group interactive instruction.

7. Assume that all students, including struggling readers and ELL students, can learn comprehension strategies.

It is vitally important that struggling readers and English Language Learners be taught comprehension strategies, even if their decoding skills are still developing. Otherwise, these students fall farther and farther behind. In 1991, Peter Johnston and Richard Allington found that students with reading difficulties were likely to get instruction that focused mainly on print accuracy, rather than on meaning and comprehension. (Johnston and Allington, 1991)

We must change our minds on this matter. Ivey comments “teachers ... may wrongly assume that struggling readers who have limited ability to read the words are incapable of thinking about text in complex ways.” (2002, p. 235)

CS/ takes an evidence-based position that struggling readers and ELL students will benefit greatly from:

- Teacher modeling
- Scaffolding
- Being read to
- Think, pair, share
- Comprehension strategies instruction
- Deep engagement in reading, thinking, and talking about text.

This view is supported by the work of researchers Sheila W. Valencia and Marsha Riddle Buly, who reported their findings in their article “Behind Test Scores: What struggling readers really need.” They conclude, among other recommendations:

... he or she [the teacher] must have access to a wide range of books and reading materials that are intellectually challenging yet accessible to students reading substantially below grade level.

(2004, p. 529)

The teacher read-aloud and think-aloud activities scaffold struggling readers and ELL students, enabling them to work successfully with on-grade-level text. This is supported by Cunningham and Allington (1999), who suggest that struggling readers and ELL students need to be exposed to grade-level ideas, text structures, and vocabulary.

In the Engaging the Text Project (Dalton, Pisha, Eagleton, Coyne, and Deysher, 2001) worked with middle school teachers and struggling readers. They described the struggling readers as having learning disabilities. These students struggled with:

- Decoding
- Fluent reading and text comprehension (Ehri, 1994).
- Comprehension
- Monitoring
- Taking action when they didn’t understand (Lipson and Wixon, 1997).

Studies [with learning disabled students] indicate that they benefit from supports such as vocabulary definitions provided as hypertext links (MacArthur and Haynes, 1995, quoted by Rose and Dalton, 2002, p. 268). CS/ includes pop-up definitions for selected words. Fry and Gosky (2007/2008) studied how middle school students’ comprehension was affected when they read a social studies text that included a pop-up dictionary. The research showed “pop-up dictionary reading was...a statistically effective method for improving student test scores” (p. 127). The researchers concluded their results suggest “pop-up dictionaries provide a helpful intervention for increasing middle-level learners’ reading comprehension” (p.127).

Conclusion

CSI is carefully developed to provide teachers and students with an evidence-based resource for comprehension instruction. *CSI* draws from research into effective literacy learning and learning theory in general. *CSI* addresses the well-documented needs for middle years students to learn through explicit instruction and cooperative group activity and for metacognitive approaches to be prominent. An overriding goal of *CSI* is that it be an easy-to-use yet powerful tool for middle years teachers to use in improving literacy outcomes for all their students. *CSI* is specially designed to work well with struggling readers and ELL students, who have well-documented weaknesses in comprehension, but the program will also benefit all middle years students, who face learning in an increasingly complex world.

A final word to educators

Learning comprehension strategies takes time. Developing skilled comprehenders requires that comprehension instruction occur over a very long period. *CSI* does not pretend to be a full program of comprehension instruction. *CSI* can be best viewed as a program that opens the door to comprehension instruction and gives students access to strategies that they can use for the rest of their lives, and knowledge of how to apply them.

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